



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/571,797	07/19/2006	Salvador Aldrett-Lee	63686	1293
109 7590 08/11/2009 The Dow Chemical Company Intellectual Property Section P.O. Box 1967 Midland, MI 48641-1967				
EXAMINER				
GALLIS, DAVID E				
ART UNIT		PAPER NUMBER		
1625				
MAIL DATE		DELIVERY MODE		
08/11/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/571,797

**Applicant(s)**

ALDRETT-LEE ET AL.

**Examiner**

DAVID E. GALLIS

**Art Unit**

1625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date 7/19/06
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 1 through 36 are pending. Applicants' claim to foreign priority by application PCT/US2003/030076 filed September 24, 2003 is acknowledged.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5, 8, 10, 12, 16 through 20, 29, 31 and 33 rejected under 35 U.S.C. 102(b) as being anticipated by Nakahara et al. (US 2002/165407, November 7, 2002, cited by Applicants).
4. Claims 1, 5, 8, 10, 12, 16 through 20, 29, 31 and 33 are drawn to an apparatus and method for at least one of manufacture, purification, handling and storage of a subject ethylenically unsaturated monomer, the apparatus comprising an inlet for an oxygen-containing gas, and at least a portion of the apparatus in contact with the monomer comprising a metal containing sufficient copper to inhibit, in the presence of the oxygen-containing gas, polymerization of the monomer within the apparatus. The copper containing alloy is further limited to a metal comprising copper and nickel, and the apparatus is further limited to a distillation column, column trays, piping and a fitting. The monomer is further limited to acrylic acid, methacrylic acid and alkylacrylic acids.
5. Nakahara et al. clearly anticipate claim 1, 5, 8, 10, 12, 16 through 20, 29, 31 and 33 teaching a process and apparatus for the production of production of acrylic and

methacrylic acid, wherein the apparatus is a copper and nickel containing alloy and the process and apparatus effectively inhibits the polymerization of acrylic and methacrylic acid monomers in the presence of molecular oxygen (page 1, ¶¶0011 through ¶¶0013 and page 2, EXAMPLE 1, ¶¶0048). Nakahara et al. teach apparatuses composed of such alloy to include reactors, absorbers, stripping columns, extraction columns, distillation columns, and their fittings such as heat exchangers, piping and tanks (page 1, ¶¶0016), and specifically exemplify a distillation system inclusive of the distillation column and tray plates (¶¶0048).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2 through 4, 9, 11, 13 through 15, 21 through 26, 30, 32 and 34 through 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara et al. (US 2002/165407, November 7, 2002, cited by Applicants).

8. Independent claims 1 and 16 are clearly anticipated by Nakahara et al. as discussed above. Claims 2 through 4, 9, 11, 13 through 15, 21 through 26, 30, 32 and 34 through 36 further limit claims 1 and 16 to at least 10%, 25 to 75% and 30 to 50% copper content, a distillation column with a oxygen inlet and trays and packing composed of alloy, air as an oxygen containing gas and an oxygen content of at least

5%, introduction of the gas into the lower portion of an apparatus or distillation column, and inhibition of acrylic, ethyl acrylic and butyl acrylic acid monomer polymerization.

9. Claims 2 through 4, 9, 11, 13 through 15, 21 through 26, 30, 32 and 34 through 36 are obvious over Nakahara et al. While Nakahara et al. applies their method and apparatus to methacrylic acid, the instantly claimed acrylic, ethyl acrylic and butyl acrylic acids are obvious variants of methacrylic acid. Additionally, it is prima facie obvious that packing and or trays associated with a distillation column apparatus would be composed of the claimed polymerization inhibiting metal, Since these are the surfaces that are designed with maximal surface area and required to be in contact with the monomer as matter of function. Likewise, since Narahara et al. show inhibition with a maximum copper content of the metal of 7%, greater amounts (i.e. 10%, 25 to 75% and 30 to 50%) would obviously offer at least the same level of inhibition (see ¶¶0017 – ¶¶0040 and EXAMPLES 1-3 and COMPARATIVE EXAMPLE 1). Nakahara et al. also teach the use of molecular oxygen (an oxygen containing gas) in an amount based on monomer vapor content (see ¶¶0044 and ¶¶0049). The instantly claimed oxygen content of the gas introduced is mere design selection and would be obvious to one skilled in the art. Nakahara et al. introduce the gas into the re-boiler of a distillation system, which obviously constitutes the lower portion of the apparatus or distillation column.

***Claim Rejections - 35 USC § 112***

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 6, 7, 27 and 28 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for alloys containing nickel and copper, does not reasonably provide enablement for alloys containing zinc and tin. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

12. The use of zinc and tin containing alloys for the inhibition of polymerization is not addressed in the specification. The effect these elements have on monomer stabilization, be it inhibitory or catalytic, has not been demonstrated.

"The factors to be considered in making an enablement rejection have been summarized as a) the quantity of experimentation necessary, b) the amount of direction or guidance presented, c) the presence or absence of working examples, d) the nature of the invention, e) the state of the prior art, f) the relative skill of those in that art, g) the predictability or unpredictability of the art, h) and the breadth of the claims", *In re Rainer*, 146 USPQ 218 (1965); *In re Colianni*, 195 USPQ 150, *Ex parte Formal*, 230 USPQ 546.

a) Determination of the effects of zinc and tin toward all known monomers would require extensive experimentation. b) The direction concerning the inclusion of zinc and tin is found in the disclosure on page 5. c) There is no disclosed working example of alloy inclusive of zinc or tin. d) The nature of the invention is metallurgical and organic chemistries. e) The state of the art currently lacks any single method that extrapolates the effects of a metal such as copper to that of other metals. f) Artisans using Applicants' invention would require a Ph.D. in metallurgical chemistry and many years of

experience polymer chemistry. g) It is well established that "the scope of enablement varies inversely with the degree of unpredictability of the factors involved", and the effects of varied elements on monomer stability is considered to be an unpredictable factor. h) The breadth of the alloys claimed includes elements whose beneficial use is of a speculative nature.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Gallis whose telephone number is 571-272-9068. The examiner can normally be reached on Mon-Thur 8:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571-272-1600. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information

Art Unit: 1625

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David E. Gallis  
Patent Examiner

/ Bernard Dentz/

Primary Examiner, Art Unit 1625